

### THE AGRICULTURE OF MODERN EGYPT.

*Text-Book of Egyptian Agriculture.* Edited by G. P. Foaden and F. Fletcher. Vol. i. Pp. 320. (Cairo: Ministry of Education, 1908.) Price 30 P.T.

THE introduction of agricultural schools and colleges into countries where agriculture has hitherto been nothing more than a tradition must inevitably lead to the production of a number of text-books specially written for particular countries. Although the same broad principles hold everywhere, the factors coming into play are so numerous that the student cannot apply the principles to particular cases until he has had considerable experience in the analysis of agricultural problems. He must, indeed, learn his principles through the local practices, and no matter how sound a book may be, its usefulness is very limited unless it is well furnished with local applications.

The present volume is the first attempt yet made to teach agricultural science through Egyptian illustrations. The volume before us deals with soils, irrigation, land reclamation and manures. A second volume is promised dealing with crops, fungoid and insect pests, and animals. The services of several contributors have been enlisted.

The general result is distinctly satisfactory; the student gets the kind of information he wants, and probably forms a more intelligent appreciation of the principles of his subject than would otherwise be possible. The book is also useful to the non-technical reader interested in Egypt, because of its accounts of the land-development methods now in process of application.

The opening chapter deals with the Egyptian climate and its effect on crops. Then follows a long chapter on the composition and properties of soil in relation to plants, and afterwards we turn to the more special Egyptian part, which is very interesting. The valley of the Nile is bounded by high land said to be incapable of cultivation; the population is essentially agricultural and shows no sign of emigrating southwards to the Soudan; in consequence, the agriculture of Egypt must develop on intensive lines. The area of land is being increased by reclaiming the lakes and their margins and the waste lands of the interior; it is calculated that another 25 per cent. can still be added to the present cultivatable area. Drainage, reclamation, and irrigation of land are therefore described in considerable detail. The water is either pumped or syphoned out from the lake; then the canals and drains are completed, and next the land is washed with the Nile flood to remove salt, of which all but the last 1 or 2 per cent. can be readily removed. Finally, the land is levelled to facilitate irrigation; this is done by means of a scoop, but is very expensive and laborious. It is then ready for cultivation, but as it may contain 1 or 2 per cent. of salt a small millet ("dineba"), useful for fodder, and capable of withstanding salt, may be grown as a first crop, or, if the conditions are more favourable, rice. In the Wady Tumilat a reed known as samar, and used for making mats, &c., is largely cultivated for this purpose. If dineba or rice grow successfully,

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the second stage may be entered upon with a crop of berseem, or Egyptian clover, which enriches the land in nitrogen and organic matter, two defects from which it suffers. The process is now complete, and cotton or other crops can be taken; the land has not, however, attained its maximum productiveness, but will go on improving for several years. Bad spots must be improved by alterations in drainage, extra washing, or ploughing.

The composition of the solid matter brought down by the Nile naturally receives attention. On an average it contains 0.13 per cent. of nitrogen while the river is in flood, but five or six times as much in the months of low Nile. Speaking generally, Egyptian soils are said to be deficient in nitrogen and also in phosphoric acid, but only occasionally in potash.

The general chapter on soils reveals a defect from which this type of book must suffer. The subject-matter is in places rather out of date, while statements are often made on very slender evidence. Far too much is made of an alleged acid excretion from the plant root; there is really no evidence that anything except carbonic acid is given off. Sulphate of ammonia is incorrectly said to be of no value as manure unless nitrifying organisms are present. Salts are stated to diffuse upwards in the soil even when there is no upward movement of the soil water. The existence in the soil is assumed of waste products of plant life injurious to other plants. Other instances might be quoted. These things can, of course, be put right in subsequent editions, but it is in the direction of keeping the strictly general and scientific matter up to date that writers of local text-books will find their chief difficulty.

### THE BINNENTHAL.

*La Vallée de Binn (Valais). Étude géographique, géologique, mineralogique, et pittoresque.* By Léon Desbuissons. Pp. viii+328 and map. (Lausanne: Georges Bridel et Cie., 1909.) Price 10 francs.

THE Binnenthal, a valley in the south of Switzerland on the Italian border, is little known to the many English people who yearly visit that delightful country. It was "discovered" more than twenty-five years ago by a well-known member of the Alpine Club. He loved the quiet and beauty of this valley, as well as the numerous walks and climbs; when his friends asked him to describe it, his answer was, "There is no glacier there and no alpine glow," and, thanks to his reply, the valley has remained unspoilt by the tourist crowd.

For the last ten years the Binnenthal has attracted the special attention of mineralogists on account of the discovery of more than twelve minerals new to science; some of these consist only of a few minute crystals of which there is not yet sufficient material for a chemical analysis.

M. Desbuisson has produced, with the able assistance of numerous men of science and writers, a very interesting account of the natural and local history of the Binnenthal. This book contains a number of

beautiful photographs and drawings by the author; especially worthy of mention are the photographs of "Les Gorges des Twingen" and "Le Hamlau de Z'Binnen"; there are also excellent maps, in the execution of which his position as Géographe du Ministre des Affaires étrangères has given him exceptional facility.

The first chapter describes the streams and waterfalls, the contour of the surrounding mountains, the valleys and passes, taking the more important mountains in separate groups. Chapter ii. deals with the geology of the district, and is accompanied with some sections after Dr. Schardt and a geological map after Prof. Schmidt and Dr. Preiswerk. Until recently this district has presented one of the most difficult geological problems in Switzerland, but through the study of the arrangement of the rocks exposed in piercing Monte Leone for the Simplon tunnel, MM. Schardt, Schmidt, and Preiswerk have been enabled to elucidate the geological difficulties of the Binnenthal district. To geologists visiting this valley, this chapter and the numerous references to other authors will be of much assistance, even though M. Desbuisson's deductions may not be entirely accepted.

Chapter iii. is devoted to mineralogy, a subject occupying nearly half the book. The number of different minerals found in this district amounts to more than eighty; of these, fourteen are new minerals found in the Lengenbach quarry. The author gives a short description of the different minerals, with references to original papers. The arrangement is puzzling, as he mixes the carbonates, the sulphates, and the oxides together, and writes calcite  $\text{CaCO}_3$ , siderite  $\text{CO}_3\text{Fe}$ , anhydrite  $\text{SO}_4\text{Ca}$ , barytes  $\text{BaSO}_4$ . There are ten plates of various crystals photographed by the author from specimens in the collections of M. Gustave Seligmann, of Coblenz, the École des Mines, Paris, and from the author's own collection. They may be interesting as records of these specimens, but are of little assistance in helping the collector to recognise these rare minerals. Photographs of minerals are seldom satisfactory, except those in Miers's "Mineralogy," which have been outlined and shaded by Miss Miers. Chapter iv. describes the history and customs of the people. This is written in a very interesting manner, and gives a vivid picture of the development of the valley and the lives of the inhabitants. References are made to that very interesting book of M. Charles Biermann, "Vallée de Conches," and to Dr. Bernouilli's account of the prehistoric remains found when enlarging the hotel at Binn. The rings, brooches, and other objects found in the graves are now preserved in a case in the hotel.

Slight mention is made of the animals and birds of the district, but a complete list of the plants is given in an appendix by Dr. A. Binz; we should like also to have seen an equally complete list of the rare and beautiful butterflies and beetles for which the Binnenthal is remarkable, and which so greatly attract the notice of entomologists. The last chapter gives a clear and accurate description of the walks and climbs, but of the latter many are too difficult and

hazardous to be attempted without a guide. We may conclude by saying that this artistically written and carefully compiled account will add much to the interest and enjoyment of those visiting the Binnenthal, and we think that an abridged edition in English would be most acceptable to the English and American visitors.

#### HYDRAULICS.

*Text-book on Hydraulics.* By G. E. Russell. Pp. vii+183. (New York: Henry Holt and Co., 1909.) Price 2.50 dollars.

WITH the advent of electricity, and in the first flush of its successful application to many purposes hitherto served by water, it was claimed that the days of hydraulic power were numbered, and that ere long the study of hydraulics would lose all except merely academical interest. That such has not proved to be the case is now a matter of common knowledge, and, in fact, the rivalry between the two motive agencies can only be said to have been stimulating alike to both of them. In regard to their industrial application, there are wide and distinct fields of usefulness for each, and, rightly understood, the two sciences are collaterally valuable, and even, to some degree, complementary. Altogether, far from the relegation of hydraulics to a background of obscurity and neglect, there has, of late years, been a decided recrudescence of interest in the science which engaged the attention of philosophers more than 2000 years ago, and has been dignified by the researches of Archimedes, Bernouilli and Pascal.

Many are the text-books which have been written for the benefit of the student, and the majority of them approach the subject from a practical point of view, or, at any rate, give a decided prominence to its more utilitarian aspects. Mr. Russell considers that there is still room for a text-book dealing with principles alone, and he has accordingly restricted his work to a discussion of the "more common and important problems." This programme does not, of course, afford much scope for originality of matter nor for novelty of treatment; moreover, it does not appear that either of these was the author's intention. The object aimed at, as a matter of fact, has been to produce a book "suited for use in a number of courses" (at the Massachusetts Institute of Technology) "where the amount of prescribed time and the ground to be covered varies in each course."

The volume is divided into ten chapters, dealing with hydrostatics; the laws of fluid motion; discharge from orifices; flow over weirs, through pipes and in open channels; and the dynamic action of jets and streams. Each chapter terminates with a number of problems, the solutions of which, however, are not given; and there are useful reference lists to other literature on the subject-matter. Most of these are American and English works, and one notes casually the omission of any mention of the studies of Boussinesq. Neither is there any account of streamline flow, and the experimental researches in this connection of Reynolds and Hele-Shaw. But these